A non-destructive method of revealing opaque writing, which is also fairly simple and should be tried, involves the use of transparent acetate sheets and a photocopy. Copy the questioned document by, first, placing the acetate sheet under and photocopying, then over and photocopying and then both under and over the document to see if the obliteration is revealed. At the same time try different settings of the contrast control and the "expose mode" adjustment on newer copier machines to change the background contrast.

When ink is used to obliterate the writing of another ink, infrared or ultraviolet illumination will, in some cases, produce good results. The equipment used to do this is discussed in Chapter 14. Ultraviolet examination is useful only when the original writing was produced with an orange or yellow color ink. The success of using infrared on the text depends upon the amount of carbon and iron the ink contains, and likewise with the obliterating ink. If the original ink luminesces differently than the obliterating material under infrared radiation, then it is possible to photograph and decipher the obliterated writing. This is demonstrated in Figure 16-3A which shows the obliteration of the word "Example." With the use of an infrared video detector, this word became distinguishable since its ink contained more carbon than the obliterating ink.

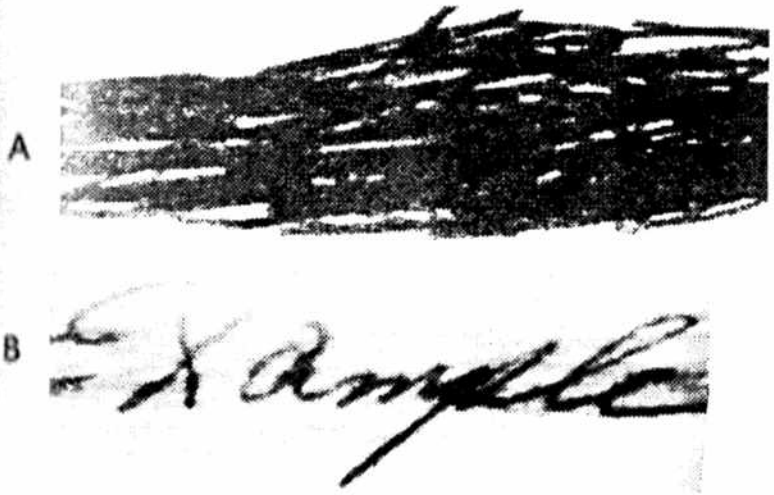


Figure 16-3. "A" shows an obliteration. After infrared radiation, the word "Example" appears as shown in "B."

Ink eradicators are used to "bleach" the dyes in inks to make them colorless. Often, the use of an ink eradicator can be detected by examination using ultraviolet light. The "bleached" ink will luminesce in ultraviolet light (unless it has been completely dissolved by other chemicals) and sometimes the results can be deciphered and photographed.

If the ink under the writing and the obliterating ink does not luminesce differently, then try extracting the writing ink from the reverse side of the paper using oblique lighting and photography. Other methods that can be used include developing indentations, which are discussed later. Lasers can also be used to penetrate water-based obliterating ink, causing it to fluoresce. Lotteries are known to use this technique to decipher fraudulent tickets.

The use of two different color inks in a check, one for writing the check itself and the other for a stamped impression might hinder the observance of a portion of its contents, especially the signature. Such stamped impressions result from the check being processed through a bank or a commercial institution such as an insurance company, government agency, accounting office, etc. Observing the writing on the check can be complicated because the stamping can be of various colors, while the check itself is a different color.

The use of infrared equipment and photography described previously by themselves are not likely to remove the stamp's impression. The additional use of color filters will be necessary. Using a filter of the same color as the stamp can remove, or substantially reduce, the markings of the stamp. Such filters can be simple and economical; they can even be made from colored plastic sheets obtained from a stationery store. An example of the ink from a stamp obscuring the writing of a check is shown in Figure 16–4. In "A," the visibility of some of the contents in the check has been diminished by the ink in the stamp. In "B," the check's contents under the stamp is revealed after the use of infrared and

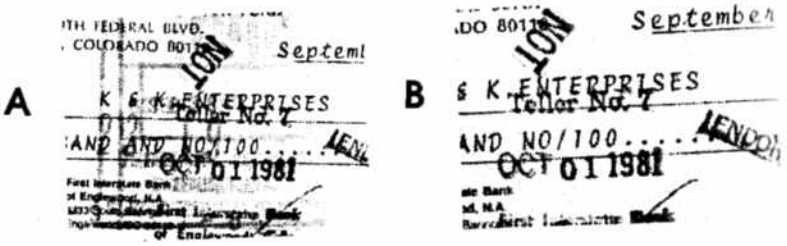


Figure 16–4. In "A," part of the check's contents is diminished by stamp markings. "B" shows the same check minus the stamp markings.

a filter. If the ink in the stamp is red or purple (as it usually is), the use of infrared is the best means of deciphering what is underneath.

The elimination of an obliterating black ink stamp is a more complex problem than colors because there are no filters available to entirely remove black. Several different techniques should be used to solve this problem. The most effective one involves creating three different negatives of the document. The first is produced with a contrast filter (try different colors), creating the best possible separation between the questioned writing and the background; the stamping should show up as white. The second negative is made using infrared, and here the black stamping again appears white. The third is a film positive made from the second negative so that the stamping appears black. When the first and third negatives are aligned exactly, the white image and black image of the stamping should cancel each other out.

Chemical Methods

There are various chemical methods of removing an obliteration in order to decipher the writing beneath it. The examiner must always be aware of the possibility of damaging the writing beneath the obliterations and/or permanently defacing some part of the document. At times, ordinary erasure of ink solvents can be used, but they must be done with such great care. They should be primarily used when pencil covers ink and some inks cover typewriting.

If the obliterating substance is correction fluid, "liquid paper," or "liquid ink," it can be removed by using a cotton swab and acetone. The swab is moistened with the acetone and then applied gently to the obliterated area until the correction fluid is removed sufficiently to decipher the writing beneath. You must determine beforehand that the procedure will not adversely affect the writing beneath.

There are certain solvents available that will render the paper translucent, without permanently affecting the paper in any adverse way or causing the ink to run. Freon is the chemical most effective, and often used for this procedure, but due to environmental restrictions it may be difficult to obtain. There are, however, other commercial chemicals on the market specifically developed to render paper translucent, such as "Liquid Window-SA," "Liquid Window-SP," and "Lucid-SA." The chemical is sprayed on the opposite side of the obliterated area. The writing gradually becomes visible as the paper becomes translucent; however, the paper will only remain so for a short time. To photographically preserve the image, have your camera ready before spraying the chemical on the document. The image will have to be reversed and should be enlarged.

Erasures

An erasure is actually an obliteration, but it is discussed separately here because of the special problems related to it. The two primary objectives in examining alleged erasures are, first, to detect the actual existence of the erasure and, then, analyze and decipher the erased writing. The method of detection and analysis for erased writing runs along the same lines as for obliterated writing.

The initial steps of erasure examinations are the most important. Consider the case where you obtain a document that your client claims has been altered through erasure and substitution. Your initial examination reveals no signs of erasure. To pursue this, try to determine the type of writing instrument used in the alleged erased writing and the method of erasure used, rubber or chemical. Sometimes the initial examination, using a stereomicroscope with oblique or backlighting, can not only answer this question, but also allow you to read the erasure. Once it is determined that an erasure has occurred, the most effective nondestructive method of deciphering it is through infrared detection. Usually both reflected and luminescent infrared lighting can produce an image of the erased writing which can then be photographed. Note that ESDA is not effective in revealing erasures.

Erasable ink from ballpoint pens can be erased with soft rubber or plastic erasures. However, such erasing is difficult and can only be done effectively if the writing is less than a few hours old. Other types of ballpoint pen inks are very difficult to erase where evidence of the erasure can be found in a portion of the writing due to abrasion of the paper fibers. Ink from felt tip pens, which slip into the paper's fibers, are almost impossible to fully erase.

When the basic non-destructive methods of restoring an erased ink writing fails, chemicals can be used to both determine if an erasure has occurred and to restore the writing. One of the oldest methods is iodine fuming, once used to develop fingerprints on paper. To utilize this method, iodine crystals are placed in the bottom of a transparent plastic container. The document is then suspended from the top and within a container that is covered and sealed. After a period of time, any disturbance of the document due to erasure will turn brown, which can be read from exposure to the fumes coming from the crystals. In some cases, differences in contrast will also permit the erased writing to become visible. Another method used involves sprinkling a fine graphite powder over the document, then shaking it in order to distribute the powder over its entirety. At times, the erased writing will be outlined and can thus be photographed when finished. The powder is gently blown off the paper, usually leaving only minor traces behind.

The erasure of pencil writing is most commonly done with a soft rubber eraser and if the writing is relatively light and the erasing is done very carefully, it is possible for the erasure to be visible using a stereomicroscope and oblique lighting. Heavy writing, on the other hand, leaves distinct traces of writing. Such erasures may be noticeable from the abrasion of the paper. However, no erasure evidence remains when soft rubber or plastic erasures are used.

Generally, other methods used are the same as for those described above. These include both destructive and non-destructive methods. However, chemical analysis is not always effective in restoring pencil writing and it is almost always distinctive. Nevertheless, one procedure that should be tried involves lightly moistening, or spraying, the document with alcohol to bring out the dye from the pencil which usually is not completely removed by the erasure. Some pencil lead contains iron, in which case the writing may be restored by using the same chemical methods applied to restore ink, described previously.

Indentations

Perhaps the best method used to decipher erased and obliterated writing, especially when all other methods fail, is to detect the identification of the writing instrument on the fibers of the paper. Because ballpoint pen ink is very difficult to eradicate, it usually is relatively easy to detect the erasure. Chemical eradication does not work as thoroughly with ballpoint pen ink as it does with other inks, and physical erasure requires great force which damages the paper fibers. Restoration then becomes the primary problem. Chemical restoration is rarely successful because of the unique composition of the ink, and non-destructive deciphering is limited due to the amount of damage to the fibers caused by the physical erasure. The greatest success then often comes from an examination of the indentations created by the ballpoint pen. An example of indentation caused by a ballpoint pen is shown in Figure 16-5. The initials "AJB" can be seen using backlighting, ultraviolet, or infrared radiation equipment with (perhaps without) a stereomicroscope.

Figure 16-5. Indentation caused by a ballpoint pen ink erasure using oblique lighting.

Determining if an ink writing is erased is usually less difficult than determining if a pencil writing is erased. This is partially due to the fact that ink writing often produces greater indentations than pencil writing, particularly those produced with a ballpoint pen. Ink writing is erased either with a rubber eraser or a chemical ink eradicator. If it is done with an eraser, there is a significant disturbance of the paper fibers because of the great amount of rubbing required to eradicate the ink. The indentations and damage caused by a rubber erasure can be detected with the usual methods of oblique lighting, backlighting, or examination with a stereomicroscope.

Perhaps the best method to use to decipher obliterated or erased writing is ESDA, especially when all other methods fail. The operation of ESDA is discussed in Chapter 14. Any pressure applied to the surface of the paper appears as dark areas or smudges when developed by ESDA, as well as the indentation. An example of the final result of such an indention, part of a threatening note used by a bank robber, is shown in Figure 15-6. Note that even though there is a smudging, the writing can be clearly detected. The writing actually appears on a transparent plastic sheet.

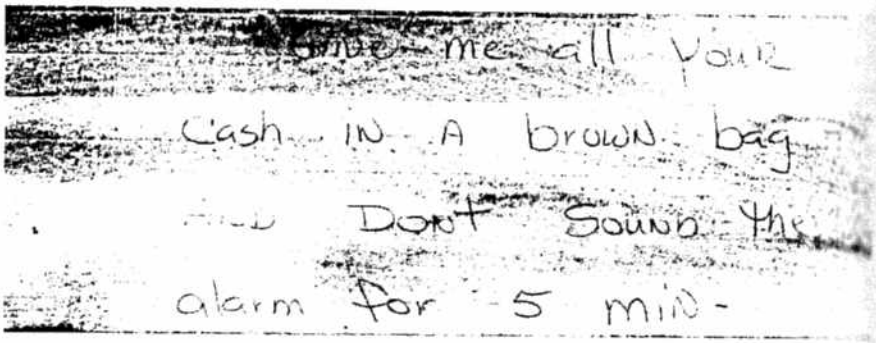


Figure 16-6. An example of the results of the use of ESDA. (Courtesy Kinderprint Co. Inc.)

Sequence of Line Crossings

If the sequence of intersecting writing is intentionally changed, the document is, in effect, altered—resulting in a fraudulent document. For example, if it were determined that a signature appeared underneath the printing in a form signifying a signature line, it would be logical to assume that this had been accomplished through chicanery. Usually this can be done using a photocopier and a sheet of paper containing

only a signature. In this case, the signature could be identified as originating from a photocopier since no crossover lines or indentations would be made in the final copy. Also, there would be no evidence of cut-and-paste. Similarly, writing could later be added to an existing contract—creating a fraudulent one.

There are two ways to determine the sequence of line crossovers. One is to magnify the suspected area at least 200-to-400 times. This was demonstrated in Chapter 15. In any case, such characteristics as crossovers, indentations, type of ink and paper used, stroke and pressure will help determine this. Each of whese will be discussed subsequently. The examiner should be aware that what appears to be an obvious line crossing to the naked eye could very well be an optical illusion. For example, when a lighter line crosses a darker line, the darker line usually "appears" to be on top. When an ink line crosses a pencil line, the pencil line usually "appears" to be on top. Your first determination must be to see if the suspected sequence of lines does exist. One good way to disclose this is to first examine the line crossings in the unsuspected areas; then use these as a reference when examining the suspected areas. Regardless of what approach you take to solve this problem, you must remember that there is no guarantee that a creation of sequence crossings will always produce a specific effect because each situation will have its own unique qualities due to different ink and paper, different writing conditions, etc.

Magnification using the stereomicroscope coupled with the use of oblique lighting at different angles, or the use of infrared detectors, should also be tried since different inks fluoresce differently when covering or being covered by other inks. Very high magnification is very often successful (Chapter 15). All individual characteristics should be determined and noted at all points of the document.

The following examples outline various types of line crossings in suspected areas of a document. To simplify the comparison, we make the assumption that for any one example the writings, were done at the same time. It is suggested that the following examples be used for future reference, as depicted in Figure 16-7.

1. The intersection of two ink lines, produced concurrently display a diffused appearance and spread along the edges of the intersection where they meet. See Figure 16-7A.

2. In "B" a fluid ink line written over an existing dry ink line has sharp and well-defined edges since the ink from the fluid line runs over the dry ink line.

3. "C" shows an ink line crossing a pencil line. The crossing sequence is determined by the absence of the pencil's graphite at the point of intersection. This observance necessitates the use of oblique lighting. An illusion may exist since the pencil line appears to cross over the ink line; it happens because the ink is absorbed into the paper while the pencil's graphite just lies on top of the paper's fiber.

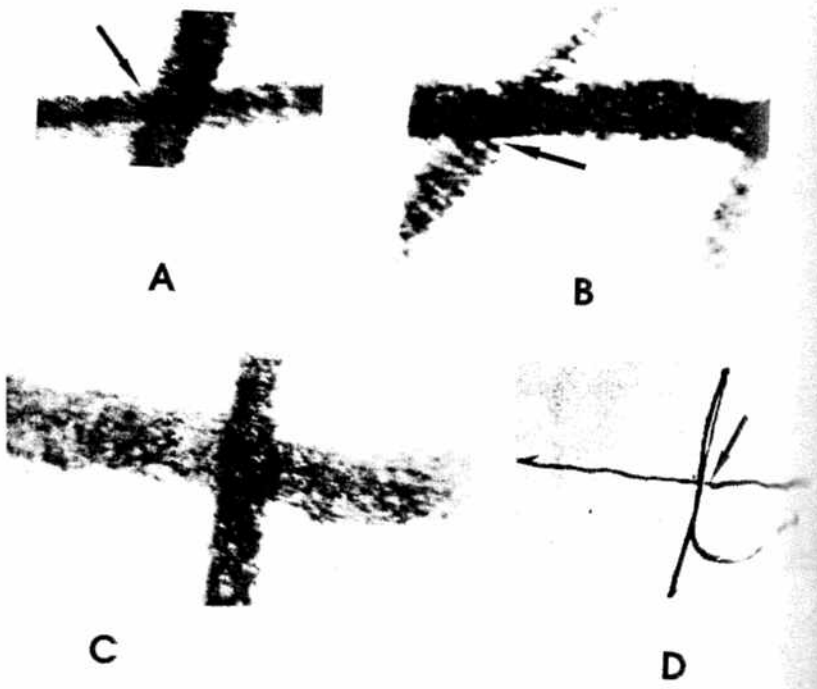


Figure 16-7. Identifying various types of line crossings. In "A," two wet ink lines cross; the vertical line is on top; the arrow indicates spreading. "B" shows a wet ink (horizontal line) crossing a dry ink; the arrow indicates sharp edges. In "C," the ink line (horizontal) crosses over a pencil line; the pencil line appears to be on top. In "D," the ink from the ballpoint pen crosses a different type of ink; the arrow indicates skipping.

4. A pencil line crossing a pencil line is relatively easy to resolve since striations are created by the movement of both lines. The second pencil line crossing over the first line will show continuous unbroken striations.

5. When a ballpoint pen ink line crosses over an ink line of another type of writing instrument, it skips rather than being absorbed as the ballpoint pen uses an oil-based ink. This also depends upon the ink composition of the other writing instrument. A small blank space, or skipping, can sometimes be observed in the ballpoint ink pen line just after it crosses the ink line of the other pen as shown in Figure 16-7D.

6. It may be difficult to determine if a certain ink line crosses over a ballpoint pen ink line. Sometimes there will be an observable narrowing in the ballpoint pen ink line at the intersection of the gaps in the other line. However, this is not always the case.

7. When a pencil line is placed over a ballpoint pen ink line, it usually shows up clearly in an infrared examination. However, this does not readily show up when the ballpoint pen ink line is placed over the pencil line.

8. Consider the case of two ballpoint pen ink writings. Ballpoint pen writing usually results in an indentation of the paper, especially when the pressure of one of the pens is heavy. This can be seen under magnification using oblique lighting. If a pen line is seen to skip over the original indented line, ink is not picked up by the ball of the ballpoint pen; this results in a blank indentation space on the opposite side of the line being crossed. If the second line is produced with heavier pressure than the first, the "cutting through" can sometimes be seen on the indentation edges of the first line.

9. In the case of different color inks, color particles in the second line can sometimes be detected that have been picked up from the first line.

10. Any ink line written over an erasure will tend to result in "feathering."

11. Typewriting over handwriting, where the handwriting is first initiated (or through the use a photograph as explained earlier), is indicative of a fraudulent document. This is shown in Figure 15-2C and discussed in Chapter 15. (Compare this with a signature that is applied over typewriting shown in Figure 15-1C.) When typewriting is over the handwriting, the typewriting dominates and is not disturbed by the ink line. When the handwriting is over the typewriting there is microscopic "streak" disturbance in the writing that

appears at all points including those at the intersection. The illusion is that the typewriting does not exist. Sometimes, when the ink crosses the writing, its oils repels the typing inks, and gaps appear in the ink line. The examiner should not underestimate the difficulty in determining the sequence of line crossings in such cases. Therefore, other methods of checking, including that of indentations and individual characteristics, should also be employed here.

Another procedure that can be used to determine the sequence of writing with a ballpoint pen and typewriting involves the gentle scraping or the chipping away of a small amount of the typewritten material (which is mostly carbon) using a scalpel or a large straight needle. This should be done while viewing the procedure through a stereomicroscope so that the document will be altered only minimally. When the carbon is removed, note if the ink line still remains on the paper. If it does, the ink line was placed on the paper first. If the ink line no longer remains on the paper, then the typewriting was first placed on the paper.

Folds In A Document

Sometimes the writing across a fold in a document can be instrumental in determining a fraudulent document, once the condition of the writing is determined. Its importance is based on whether or not the writing was done before or after the fold. Folding disturbs the paper fibers which, in turn, result in the absorption and spreading of the ink. When a writing occurs across a fold, the ink spreads laterally, sometimes to the extent that ink penetration is so great it can be seen using underlighting on the opposite side of the paper.

If writing is generated before paper is folded, ink spreading does not occur and the ink line remains unaffected, or there will be tiny breaks in it. Figure 16-8A depicts this. The arrows indicate breaks in the ink line after the paper was folded, beacuse the paper fibers become exposed. In "B," an ink line is written after a fold already exists; arrows indicate the direction of spreading along the fold.

The aforementioned does not necessarily include ballpoint ink since it does not ordinarily spread when written across a fold. The pen simply skips across the fold and sometimes leaves a deposit of excess ink coming from the ball housing. Typewriting and pencil lines are more difficult to discern. There is very little effect on ballpoint lines if the document is folded after they were made. When typewriting and pencil lines are produced on a fold, there is some interruption created by the ridges or in the paper fibers, resulting from the folding.

Unfortunately, the above does not always hold true. That is, a line

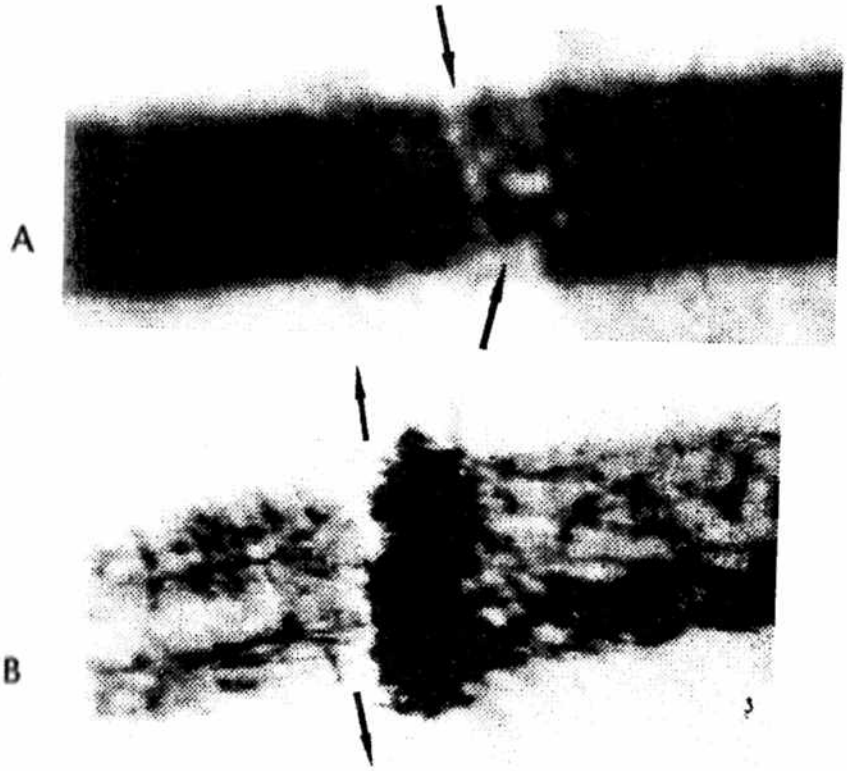


Figure 16–8. Results of an ink line crossing a fold in a paper. In "A," the ink line is made before folding; in "B," after folding.

written across a fold does not necessarily produce the results mentioned. The reason for this is that other factors enter in, such as the depth and severity of the fold, the amount of pressure used to induce it, the position of the writer, etc. In other words, each case must be considered unique and tested as such. Needless to say, each requires separate research and experimentation.

Transfer of Signatures

Prior to 1950, signatures from ballpoint pens could be lifted and transferred to another document since the ink used olein as a base, which has an oily texture with a high dye content. Such a texture prevented

the ink from adhering to the paper, resulting in smudging and dis- tion. Although crude, this permitted the transfer of a signatur one document to another using such readily available materials as phane (or Scotch) tape. This did not present a major problem document examiner since the obvious manipulation was easily de Besides smudging and discoloration, there was distortion of the lin ity and many points of little or no pressure indications. In additio transferred signature did not have indentations or striations. After the ballpoint formula was improved upon—making such transfer This formula was produced with a polyethylene glycol base usi oil and dyestuff, resulting in greater adherence of the ink to the pa

It is possible to transfer pencil writing using cellophane tape graphite particles lie on top of the paper fibers that easily adher tape. The tape is then carefully placed onto the intended forged ment. The results look realistic. (See Figure 16-9.) However, th cannot be removed easily since the graphite signature remains at to it and the obvious transfer is exposed. In any case, a signatur tape over it should be viewed with suspicion.

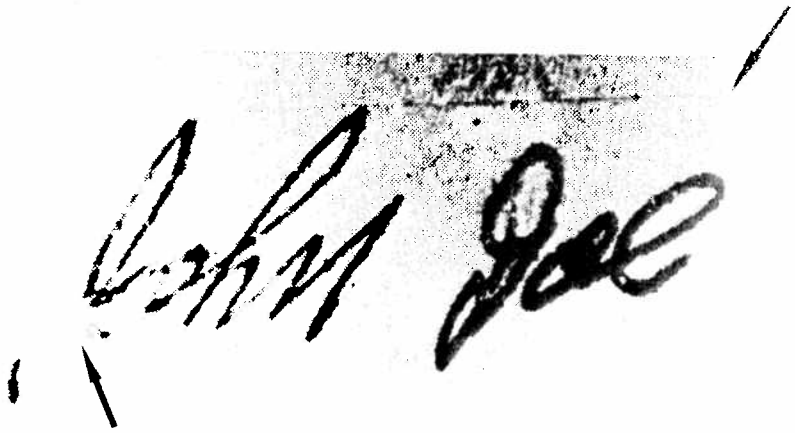


Figure 16-9. Pencil signature transferred with tape. Arrows ind edges of the tape and missing graphite particles in th nature.

An even more effective method of signature transfer uses a pl copier and transparent acetate sheets. Variations of this procedu be used.

1. Place the face of the document onto the platen of a photocopier face up (reverse of what is normally done).

2. Place a black, opaque backing sheet on top of the document.

3. Set the contrast to its highest level and produce a copy. Also make an "exposed mode" adjustment if the photocopier has one—which should be experimented with at the same time.

4. Experiment by using different settings of the contrast control for optimal revelation of the obliterations.

5. Use the same procedure employing an acetate transparency in place of the copier paper.

6. If the results are unsatisfactory, place a transparent acetate sheet underneath the document before performing steps 1 and 2.

Erasable Inks

In 1979, Paper Mate introduced the first erasable ballpoint pen which utilized an eraser in the writing instrument. The erasable ink is considerably thicker than regular ballpoint ink and thus cannot easily penetrate paper fibers. In turn, the erasure is easily done and fewer, if any, traces are left on the paper. Fortunately, such ink becomes more difficult to erase if it remains on the paper too long, say for a few days, and then when there is an erasure, tell-tale ink marks result. The paper's fiber structure determines the amount of ink penetration.

Several years later, the erasable felt pen ink was introduced. The ink of this pen is more detectable than that of the ballpoint. The following non-destructive methods can be used for the felt pen: heat exposure; infrared luminescence; short and longer wave ultraviolet radiation; laser and pH testing. The use of infrared testing is ineffective. Furthermore, such inks become visible anyway after several weeks.

Erasable ballpoint ink, because of its long drying time, can be easily transferred using cellophane tape. This can only be effectively done while the ink is wet; the longer it remains on the paper, the more difficult it is to transfer. The quality of the lift depends upon the type of erasable ink involved and the type of paper used. To determine such a lift, use the aforementioned methods. Note if there is smudging, discoloration, and lack of indentations and striations. In any case, revealing erasable inks has not proven to be a major obstacle for the document examiner. How-

ever, he should always be alert and aware of new situations that constantly arise and present new challenges.

Invisible or Disappearing Ink

This type of ink is usually sold commercially as "Mark B-Gone" ink which as a general rule disappears in one-to-three days after application. When dealing with this kind of ink, the examiner must make it appear long enough so that it can be photographed. Traditional techniques such as magnification, oblique lighting, ultraviolet examination, or a combination of these will probably bring limited results, or none at all. Treating such ink with an alkaline solution, such as that of diluted "Drano" crystals, sprayed lightly with an atomizer across the suspected area usually causes the writing to surface but only for a short time. Be prepared to photograph the writing immediately. By placing glass over the writing, it reveals the disappearance more readily. If unable to photograph in time, the process should be repeated.

Such invisible writing is apt to be found in espionage investigations normally conducted by government agencies rather than the document examiner. Nevertheless, the examiner may encounter a situation like the one exemplified in Figure 16-10 which shows a blank check in "A," the writing of which is missing since invisible ink was used. In "B," the contents are barely restored and only temporarily with a photograph quickly taken.

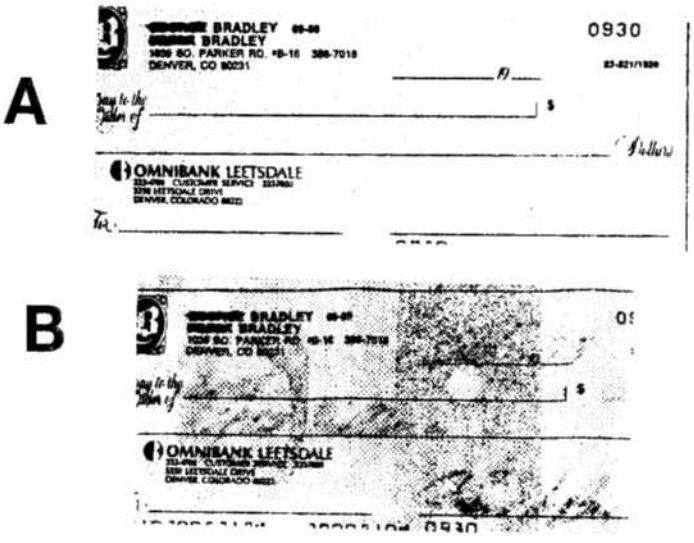


Figure 16-10. "A" shows invisible writing ink using photography; the writing is restored in "B" but is barely visible.

Colorless liquids, such as vegetable oils, fruit juices, wine, etc., also fall into this category. These do not have a long life span. If suspected, experiment with different, aforementioned methods to see if discovery reveals the contents. Non-distructive methods should be tried first. These include looking for indentations, disturbed paper fibers, blurs, scratches, trash marks and paper discoloration. Use ultraviolet and infrared lighting with oblique lighting. Experiment by very carefully applying heat to the suspected areas. Moisten the suspected area and observe translucence. Experiment with iodine fuming.

Charred Documents

Deciphering charred documents requires a special technique. They might arise in either civil or criminal investigations. These include such documents as wills, deeds, checks, notes, lease agreements, stock certificates, bonds and currency. They are sometimes accidentally charred or severely damaged by fire; other documents are burned intentionally to prevent them from becoming incriminating evidence. It is best to examine such documents at the scene lest they break up into indistinguishable pieces. If they are shattered into small fragments or reduced to ashes, they are almost impossible to decipher.

All charred documents should be handled with the understanding that they might break into tiny, indecipherable pieces even with the slightest disturbance. Until the document is in the laboratory, no attempt should be made to unfold any pages, flatten curled paper, or separate a stack of pages. If possible, the document should be transported to the laboratory in its original container. If one does not exist, the document should be placed in a portable container, for example, even a cereal box, but only if the document can be handled without falling to pieces. It is a good idea to cover the container with cotton or a soft cushioned material like a hand towel, to prevent movement or air disturbances which could disintegrate the document. Its transport should always be done with a slow and steady movement.

Keep in mind that the primary goal of a laboratory examination of a charred document is stabilization, restoration, and deciphering of the document. A number of techniques for restoration and deciphering produces different results in different situations, depending on the type of paper the document is made of, the extent of the damage, etc. Sometimes, a simple, but careful, visual examination produces the desired results, but only if the document is not too badly damaged. For example, the magnetic ink used to print coded numbers on checks turns red in response to extreme heat and often stands out against a dark,

charred background. In most cases, however, the document has to undergo a more intensive analysis, which first requires stabilization.

Stabilization involves a method of restoring moisture to the document that makes it less brittle. The document is placed on a glass plate and a solution of polyvinyl acetate in acetone is applied to the document with an eyedropper, using only small amounts at a time. The solution penetrates and binds the paper. If too much solution is used, the document takes on a clouded appearance. The glass plate should first be coated with silicon fluid in petrol ether to prevent the document from sticking to it.

An alternate method is to apply a solution of water or alcohol and glycerol to a small corner of the document. If it does not respond adversely, you should proceed to apply the solution to the rest of the document, covering only small areas at a time. If the document is extremely brittle, pieces may have to be broken off and treated individually, then rearranged on a glass plate in its original form, much like a jigsaw puzzle. During these procedures always be sure to use the correct tools, such as tweezers, atomizers, eyedroppers, etc. In some cases, documents can also be softened with steam.

The document shown in Figure 16-11A was burned and charred and then doused with water. The remains were carefully placed between two sheets of ordinary plate glass to prevent it from disintegrating. Using a stereomicroscope and oblique lighting, the document was photographed (shown in "B") about ten minutes later before a solution of water and glycerine was applied. Only a portion of the document was recognizable; the rest was burned beyond recognition. The use of ultraviolet and infrared radiation should also be tried in such cases.

Another method of deciphering a charred document is using contact photography. Here the charred document is placed between two unexposed photographic plates, and they are kept tightly bound together, away from light, for 2-to-3 weeks. The plates are fogged by gas emanating from the charred material except where the writing appears on the document. Thus, a negative image of the writing is produced on the plates. A positive image can then be produced using normal photographic procedures, and the final product is an accurate reproduction of the document before it became charred. This procedure is only successful if a fairly short period of time has elapsed between the charring of the document and exposure to photographic plates.

When the above methods do not produce positive results, some chemical examinations allow the examiner to decipher the document. However, they will usually permanently destroy what is left of the document. In one procedure, the document is immersed in a chloral hydrate and alcohol solution and dried several times, and then it is immersed in

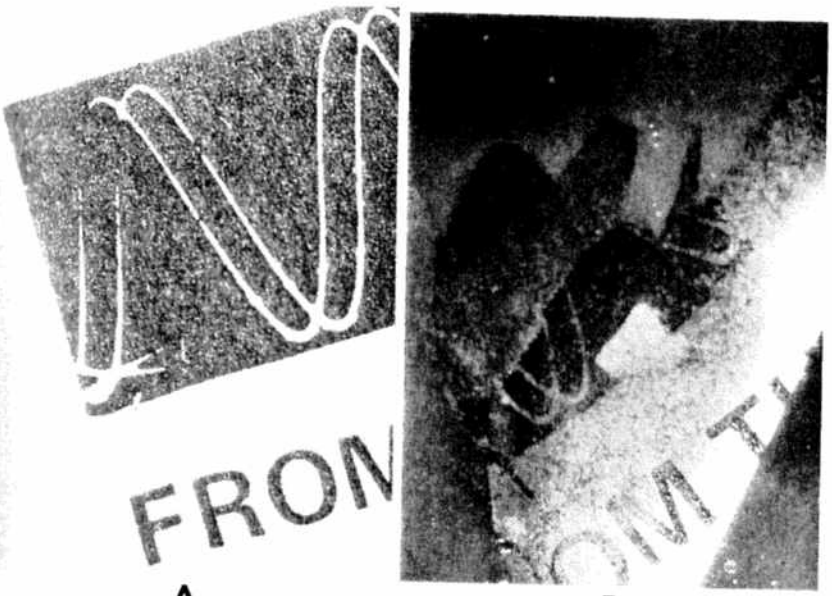


Figure 16–11. "A" is a document. "B," same document, after being burned and charred, using oblique lighting and an application of water and glycerine before being photographed.

a glycerin solution. This sometimes produces a sharp contrast between the paper and the writing thereby disclosing the writing.

A document can also be deciphered when immersed in a solution of water, glycerin, and alcohol. The writing becomes readable at various stages of immersion, so the process has to be observed carefully. Still another method involves immersing the document in a solution of mineral oil and petroleum spirits and then the document is examined under ultraviolet light. In some instances, the paper and the writing absorbs the oil at different rates and fluoresces differently, which allows for deciphering.

In all of these cases, once the document is deciphered, it should be photographed. This is the only way to guarantee a reliable, permanent record of the writing. At this point, the writing can be further examined and, in some instances, compared to known writings, and then identified in the usual manner.

Water-Soaked Documents

These usually accompany charred documents from water used to douse a fire. Printing, pencil writing, typewriting and most ballpoint writing usually is not affected by water. Iron-based inks are only partially affected by water. Therefore, deciphering a document should prove to be not too difficult provided, of course, that the paper has not been severely damaged. Keep in mind that washable inks are totally affected. Unless, there are indentations to work with, chances of restoring the contents are nearly impossible.

Summary

- The examiner must detect the existence of an alteration before proceeding to determine a solution.
- When deciphering an alteration, non-destructive methods should be tried first. For chemical destructive methods, written permission from the client must first be obtained in writing. These methods should first be experimented with and duplicated using the same type materials.
- Deciphering an alteration requires patience, creativity, and attention to detail since each problem is unique, necessitating the use of both old and new methods or a combination of these.
- The primary goal in revealing obliterations is to make the contents of the document visible long enough to be photographed.
- The key in solving obliterated problems is determining what materials were used for both questioned and known documents and knowing how certain procedures will affect them both.
- The equipment an examiner can use to discover obliterations includes the stereomiscroscope, photography equipment, oblique lighting and backlighting, ultraviolet and infrared detectors, photocopiers, filters, chemicals and ESDA.
- When dealing with erasures, the stereomicroscope used with oblique or backlighting, usually works best. Otherwise, chemical means should be tried.

- When a contract is suspected of being fraudulent, the examiner should proceed to check the sequence of line crossings between the typewriting, or printing, and the writing; he must be extremely cautious before offering a positive opinion.

- The examiner should not trust his naked eye to determine a line crossing sequence since false illusions are often created.

- Folds in a document, which may be instrumental in forming an opinion of a case, should be determined to see if they were done before or after the document was created.

- There are several ways to transfer a signature from one document to another. The use of photocopies to commit fraud presents a great challenge to the examiner.

- Although the erasable ink pen has not proven to be a major obstacle for the examiner, he should be constantly aware of its existence. Once solved, restoration of the writing is almost always possible, at least for a short period of time.

- The method to decipher a charred document is, first, stabilization and restoration. Every effort must be made to prevent movement or disturbance which could easily disintegrate the document into indistinguishable pieces.

Questions

A document is suspected of being fraudulent by alteration. What steps should be taken to verify this?

Name at least three possible indicators of a fraudulent document.

An obliteration in a document is suspected. What are several methods of approach that should be used in determining the cause?

A canceled check is stamped with red ink obscuring some pertinent writing. What steps should be taken to observe the writing? What if the stamp color was black?

What is the advantage of, first, checking for indentations in a ballpoint pen obliteration?

If printed matter in a contract appears over the signature, would this be considered fraudulent? Why?

Why shouldn't the examiner trust his naked eye to determine the sequence of line crossings?

When an ink line crosses a pen line, why does the illusion of the opposite occur?

How can the sequence of line crossings of the writing of two ballpoint pens be determined?

Why should the examiner be concerned with folds existing in a document?

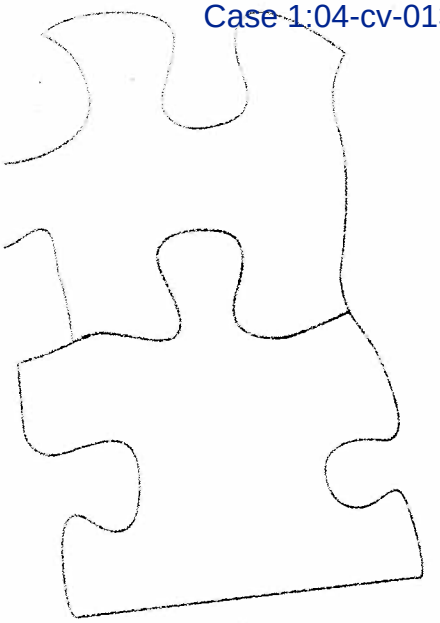
With the use of a ballpoint pen, should the examiner be concerned with the transfer of signatures? Why? What if a pencil was used?

When it comes to erasures using a ballpoint pen, what special problem is the examiner apt to encounter?

What procedure should the examiner employ when the use of invisible ink is suspected?

You are called to decipher a charred document at the scene of the occurrence and you want to bring it to your laboratory for examination. What specific procedure should you use?

How is stabilization accomplished when dealing with charred documents? What can be done in the deciphering and restoring of the contents of a water-soaked document?



Document Examiner Textbook

About the book:

Over 250 questions (with answers) used in cross-examinations and depositions.

Computer forgery in the 21st Century.

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